

## REMARKS

Claims 1 – 25 are presently pending. In the above-identified Office Action, the Examiner finally rejected Claims 1 – 3 and 6 under 35 U.S.C. § 102(b) as being anticipated by Wood ('419). Claims 4, 5, 7 – 11, 14 – 21, 24 and 25 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Wood. Claims 12, 13, 22 and 23 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Wood in view of Zhenduo *et al.* ('145) hereinafter 'Zhenduo'.

For the reasons set forth more fully below, the subject application is deemed to properly present claims patentable over the prior art. Reconsideration, allowance and passage to issue are respectfully requested.

The present invention addresses the need in the art for an improved system or method for stabilizing the temperature of detector arrays which offers greater flexibility and more accuracy, and requires less space and power than prior art methods.

The need in the art is addressed by the system and method for stabilizing the temperature of a detector array of the present invention. The novel invention includes **one or more video reference pixels adapted to output a reference signal** that is responsive to the temperature of the detector array and a mechanism for adjusting the temperature of the detector array **based on the reference signal**.

The invention is set forth in Claims of varying scope of which Claim 1 is illustrative. Claim 1 recites:

1. A system for stabilizing the temperature of a detector array comprising:

**one or more video reference pixels adapted to output a reference signal** which is responsive to the temperature of said detector array and

means for adjusting the temperature of said detector array **based on said reference signal**. (Emphasis added.)

None of the references, taken alone or in combination, teach, disclose or suggest the invention as presently claimed. That is, none of the references, taken alone or in

combination, teach, disclose or suggest a system for stabilizing the temperature of a detector array using reference pixels to output a temperature based reference signal and means for adjusting the temperature of the detector array **based on the reference signal.**

In the above-identified Office Action, the Examiner rejected the claims with reliance primarily on Wood. Wood purports to teach a camera, an infrared focal plane array package, and a method and apparatus for generating video signals from a passive focal plane array of elements on a semiconductor substrate. The Examiner suggests that in Fig. 1, and col. 4, lines 37 – 48, Wood teaches a means 20 for adjusting the temperature of a detector array based on a reference signal. However, this assertion is error. The cited passage reads as follows:

“Also, the inventors have had some success using temperature sensors fabricated on the focal plane array chips. These sensors are periodically polled by the focal plane readout electronics in the same way as the microbolometers, and the temperature data is sent to the image processor in the same way as the microbolometer signals. The inventors have had some success in using the image processor to use these temperature signals to **improve the image quality by correcting for small temperature drifts in the cameras.** These could be microbolometers which are intentionally made unresponsive to infrared radiation.” (Emphasis added.)

The cited passage provides no such teaching suggested by the Examiner. Indeed, no such teaching is provided anywhere in the reference. On the contrary, as highlighted above, the cited passage appears to teach the use of signals from reference pixels to improve image quality by correcting for small temperature drifts in the camera.

This differs from the claimed invention, which **adjusts the temperature of the detector array, not the image output by the camera** as taught by Wood. Indeed, Wood does not provide any teaching with respect to the use of reference signals from a detector array to adjust the temperature of the array *per se*.

In response to the above argument, the Examiner suggested that Applicants' argument that "Wood does not provide any teaching with respect to the use of reference signals from a detector array to adjust the temperature of the array *per se*" is not consistent with the plain language of the reference. The Examiner then cites column 1, lines 52 – 56 of Wood which reads:

"Control leads for the thermoelectric stabilizer also pass through the vacuum chamber and allow for it to be temperature stabilized based on the temperature **sensed by the temperature sensor.**" (Emphasis added.)

and column 2, lines 34 – 50 of Wood which recite:

"The temperature of the focal plane array is kept constant by a thermoelectric controller 73 which sets the temperature **based on the output of a temperature sensor** inside the package 10. The temperature at which the array is kept is referred to as a stabilization temperature. For the microbolometers we used, the range at which this has been tested is from zero to 30°C, although there is no reason much higher or lower stabilization temperatures could not be used.

A line t indicates that temperature information is received by the thermoelectric controller. If the temperature information is what is desired, no signals will be sent over the other lines  $t_a$  and  $t_b$ . However, in the preferred embodiment the thermoelectric controller will be controlled by sending power over either line  $t_a$  and  $t_b$  depending on the direction (warmer or cooler) of the desired change in temperature." (Emphasis added.)

With these assertions, it is evident that the Examiner gives no patentable weight to the clear language of Claim 1 which calls for the temperature reference signal to be supplied by 'one or more **video reference pixels**' not merely a **temperature sensor**. The Examiner has not explained where in Wood a teaching is provided of a detector array with **one or more video reference pixels adapted to output a reference signal** which is responsive to the temperature of the detector array and **means for adjusting the temperature of the detector array based on the reference signal**. At best, Wood appears to teach the use of signals from reference pixels to improve image quality by correcting for small temperature drifts in the camera and the use of reference signals from temperature sensors (thermistors) to adjust the temperature of the array. However, it is clear that Wood does not teach the use of reference signals provided by video reference pixels in the array to provide a reference signal, which is used to adjust the temperature of the array. Hence, Applicants assert once again that the rejections of the Claims based on Wood should be withdrawn.

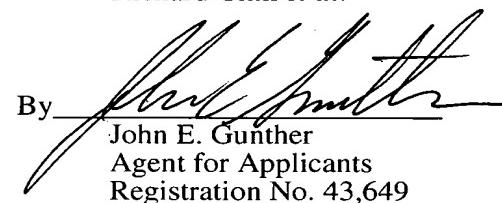
Zhenduo purports to teach a hybrid cascade model-based predictive control system. Zhenduo was cited as teaching a model based predictive control algorithm for temperature stabilization. However, Zhenduo does not provide a teaching to

overcome the fundamental shortcomings of Wood. Hence, the rejections based on a combination of the teachings of Wood and Zhenduo should be withdrawn as well.

Reconsideration, allowance and passage to issue are respectfully requested.

Respectfully submitted,  
Richard Chin *et al.*

By



John E. Gunther  
Agent for Applicants  
Registration No. 43,649

WJB/ns

Raytheon Company  
EO/E4/N119  
P.O. Box 902  
El Segundo, CA 90245

(310) 647-3723  
(310) 647-2616